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June 1, 1992

Ms. Donna Searcy  
Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Washington, D.C. 20554

Federal Communications Commission  
Office of the Secretary


RE: ET Docket No. 92-9: Redevelopment of Spectrum to  
Encourage Innovation in the Use of New  
Telecommunications Technologies

Dear Ms. Searcy:

Transmitted herewith, on behalf of the Committee on Communications and Information Policy (CCIP), of the Institute of Electrical and Electronics Engineers, Inc., United States Activities, is an original plus nine copies of the Comments in response to the Commission's Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies.

If there are any questions, please contact Deborah Rudolph at the IEEE Washington Office at the address and telephone number listed.

Sincerely,

  
Arvid G. Larson, Ph.D.  
Vice-President  
Professional Activities

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Federal Communications Commission  
Office of the Secretary

In the Matter of	)	
	)	
Redevelopment of Spectrum to	)	
Encourage Innovation in the	)	ET Docket No. 92-9
Use of New Telecommunications	)	
Technologies	)	

COMMENTS OF THE  
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.  
UNITED STATES ACTIVITIES

The Institute of Electrical and Electronics Engineers, Inc. - United States Activities ("IEEE-USA") respectfully submits these comments in response to the Federal Communications Commission's ("FCC" or "Commission") Notice of Proposed Rule Making ("NPRM") in the above captioned proceeding. In this proceeding the Commission seeks comments on a range of issues regarding the establishment of new areas of the spectrum for use by new emerging telecommunications services and technologies.

I. Introduction

The IEEE-USA commends the Commission on its ongoing efforts to assess the need for a new allocation of spectrum for emerging telecommunications services and technologies. The IEEE-USA agrees with the Commission that it "is in the best interest of the United States to make spectrum available for the development of new services and technologies".<sup>1</sup> The IEEE-USA also concurs that spectrum must be viewed as an integral element of our country's overall telecommunications infrastructure. This infrastructure should not only be capable of continuing to support the variety of advanced communications services that are integral to the efficient performance of daily commerce by American businesses and consumers, but should also be easily expandable to meet the United States' ongoing need to remain the global leader in the areas of telecommunications and information services.

While the effect of any one particular radio-based service on our country's competitiveness may be speculative, there is no doubt that a modern, ubiquitous telecommunications infrastructure is a fundamental prerequisite for maintaining a robust U.S. economy. The indisputable importance of these new services and technologies necessitates judicious planning and analysis before

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<sup>1</sup> See FCC ET Docket No. 92-9, page 4.

particular technologies and applications are chosen and implemented.

These comments on the development of emerging telecommunications technologies frequency bands are therefore predicated on the IEEE-USA's belief that the introduction of new radio services is a vital component in our country's ability to maintain its leadership role in the global marketplace.

## II. Alternative Spectrum

The IEEE-USA believes that, in addition to the creation of a spectrum reserve for emerging telecommunications services and technologies, underutilized portions of the spectrum presently assigned to the federal sector need to be identified and transferred to the private sector. This transfer of spectrum, like many of the spectrum allocation decisions that will be made in the near future, will have a strong impact on our telecommunications infrastructure well into the next century.

We, therefore, believe it is important for the National Telecommunications and Information Administration ("NTIA") and the FCC to work together in formulating an overall strategic process for ensuring efficient use of the spectrum. This cooperation is vital if we are to ensure that this resource, the limited finite capacity of which is becoming increasingly noticeable, is efficiently utilized. Such coordination could, and in the IEEE-USA's opinion should, lead to at least some non-federal use of 2 GHz frequencies now used exclusively by Federal agencies. These frequencies could be used either for new telecommunications services, for existing 2 GHz services that will have to be relocated to make room for new services in the 1850-1990 MHz band, or for some combination of both.

While it may be too early to determine whether and to what extent the adjacent government spectrum can be used for new telecommunications services and/or relocated 2 GHz services, the difficulties and costs associated with the relocation of 2 GHz incumbents to other bands necessitate a thorough examination of all possibilities including careful evaluation of the feasibility of using government bands for relocated services. We believe the time has come to reassess the uses of the entire 2 GHz band. In light of the fact that the transfer of government bands to the private sector is attracting more and more interest within the legislative branch of the government<sup>2</sup> and because of the scarcity of spectrum below 3 GHz, the IEEE-USA recommends that the FCC promptly commence discussion with the NTIA concerning expanding the availability of spectrum in the 1710-1850 MHz band for private sector use.

Furthermore, while we support the concept of relocating facilities to either wireline transmission media or higher frequency bands, the Commission should recognize that this may not be feasible for certain 2 GHz paths, some of which are used by private Operational Fixed Service ("OFS")

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<sup>2</sup> The approval of the "Emerging Telecommunications Technologies Act" (HR 531) by the House of Representatives confirms that body's perception that spectrum assigned to the federal government is not fully utilized.

and common carrier licensees and some of which are used by "essential" state and local licensees. It should be pointed out that many private and common carrier facilities carry traffic which could be considered "essential".<sup>3</sup> This being the case, we propose that a precise and complete definition of "essential" services be developed, and that the definition be based on public safety criteria. We further propose that relocation choices for all existing 2 GHz licensees be prioritized, according to the factors discussed below, and that provisioning be arranged in the 1710-1850 MHz band for those incumbents that must remain near 2 GHz. We believe that the importance of the implementation of new services is paramount, and that the Commission should establish policies that will encourage the relocation of incumbent OFS, common carrier, state and local 2 GHz licensees.<sup>4</sup>

### III. Relocation Process

In this proceeding the Commission proposes to move some OFS and common carrier licensees to frequency bands above 3 GHz.<sup>5</sup> Since the efficient use of the spectrum is not only critical to the expedient introduction of new and innovative radio technologies to the American public, but is one of the cornerstones of effective spectrum management, the IEEE-USA proposes that the Commission set, as a matter of policy, reassignment priorities for the existing 2 GHz licensees. This should be done in a manner consistent with the principles of good spectrum

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<sup>3</sup> For example, it is common for 2 GHz common carrier systems to carry "essential" public safety circuits, both dedicated and switched.

<sup>4</sup> These policies should include, for example, a provision in which new occupants of the band could assist in paying relocation costs for existing users when the new occupants desire to encourage relocation at a date earlier than otherwise required by the rules finally adopted by the Commission. They should also include a provision in which a new occupant, wishing to encourage movement, would be permitted to pay relocation costs for an existing user which may be exempt from the relocation process.

<sup>5</sup> We note that frequency congestion in the higher bands may pose obstacles to the successful migration of some 2 GHz facilities to the higher bands. The 2 GHz band is often used for long-hop, lightly-loaded point-to-point microwave facilities; the propagation characteristics of the frequency bands above 3 GHz, however, may present these facilities with additional obstacles -- rain attenuation, atmospheric absorption, etc.-- that may require the use of additional or different radio sites(s), resulting in even greater expense. Additionally, the rules for certain higher frequency bands provide for channelization plans that are intended to support high capacity systems: these plans may not provide a good "fit" for the relatively narrow channel bandwidths of 2 GHz OFS and common carrier systems. This significant difference in channel bandwidths could make frequency coordination even more difficult, and may result in spectrally-inefficient use of the higher bands.

management which have guided the Commission for many years.<sup>6</sup>

It is our opinion that when determining the destination of the relocated 2 GHz licensees, the Commission should first examine the necessity of using radio for the displaced service or application. We believe the potential use of already available or planned non-radio facilities should be carefully evaluated for each displaced service and a determination made as to whether these non-radio facilities will provide comparable capacity, reliability and cost.<sup>7</sup> Should comparable non-radio facilities be available, efficient spectrum management policy dictates that the service be transferred to non-radio facilities.

If, in such cases, radio is determined to still be the only viable transport medium, then a determination should be made as to the most suitable band for this service. Judicious application of this rule will result in the assignment of only the shortest of the current 2 GHz paths to higher frequency bands in which attenuation plays a greater role. We believe that the 10.7-11.7 GHz, 12.7-13.25 GHz and 17.7-19.7 bands are good candidates for overbuilding the shorter 2 GHz microwave links. In addition, since extensive path engineering and operational experience accumulated with radio links in the 17.7-19.7 and 21.2-23.6 GHz bands indicate that a large majority of the existing 17.7-19.7 GHz links could have been implemented in the 21.2-23.6 GHz band using the same transmission performance specifications, we propose that the 21.2-23.6 GHz band be made available to those 2 GHz facilities that use very short microwave links. We believe that by transferring many of the shorter link services to the bands above 10 GHz, more room will be available to accommodate the longer link services in the 4 and 6 GHz bands.

Nonetheless, it seems likely that congestion in the 4 and 6 GHz bands, as well as a variety of other factors, will dictate that the best choice for some facilities is to continue to operate at a frequency in the 2 GHz band. In those situations, consideration should be given to the migration

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<sup>6</sup> The FCC has traditionally taken six considerations into account when allocating spectrum. These considerations are:

- Whether radio is necessary or whether non-radio alternatives provide a practical alternative;
- Whether the proposed radio service has social and economic benefit and, in part, whether the proposed service will be used for public safety purposes;
- Whether many people will benefit from such a service;
- Whether the proposed service is viable from a social, technical and economic standpoint;
- Whether the requested frequencies are the most appropriate for the proposed service; and
- Whether existing users or the public, or both, would incur unacceptable costs in accommodating the new service.

<sup>7</sup> In this regard, since the Commission has opened the door to financial negotiation between potential new and existing users, the IEEE-USA believes the impact of the cost parameter may be mitigated.

of these systems to some portion of the 1710-1850 MHz federal government band.

#### IV. Part 21 vs. Part 94 Operation

The IEEE-USA supports the Commission's proposal to apply the existing applicable technical rules and coordination procedures of the higher common carrier and private operational fixed bands to those 2 GHz licensees who wish to relocate their operations to these bands. Under the Commission's proposal, existing 2 GHz fixed operations that relocate to the common carrier bands will be subject to the technical rules and coordination procedures of 47 CFR, Part 21, and those that relocate to private operational fixed bands will be subject to the technical rules and coordination procedures of 47 CFR, Part 94. The IEEE-USA recognizes that there will be some instances in which a 2 GHz user, subject to relocation, can not meet the existing technical rules and coordination procedures found in 47 CFR, Parts 21 and 94. We suggest that the Commission consider granting exceptions to these parties in order to provide them with usable spectrum in the higher frequency bands.

#### VII. Candidate Determination Criteria

The Commission seeks comment regarding the criteria to be applied in determining whether a new service or expansion of an existing service merits frequencies in the emerging technology bands. In response to this request, the IEEE-USA believes that the criteria used to determine which services should be considered as candidates for the proposed emerging technologies bands should be based on contemporary procedures. Presently, the FCC allocates spectrum for the non-federal sector only after according applicants due process, as required by the Administrative Procedures Act<sup>8</sup>. Proposals for spectrum allocation presented to the FCC are subject to public review and comment. In our opinion, the FCC has developed an appropriate approach, which involves a public evaluation of facts presented by an applicant and interested parties.<sup>9</sup>

Today's assignment procedures, when thoughtfully applied, result in the best overall allocation of spectrum for new services and technologies. The proper allocation of spectrum must be one of the Commission's primary objectives if efficient management of this very precious resource is to be maintained.

#### VIII. Conclusion

The IEEE-USA strongly believes that efficient use of the radio spectrum is critical to the

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<sup>8</sup> 47 U.S.C.307, 309 (e); Ashbacker Radio Corp. vs. FCC, 326 U.S. 327 (1945).

<sup>9</sup> The facts presented by the applicant are normally evaluated based on the six considerations the FCC takes into account when making allocation decisions (see footnote 6).

expedient introduction of new and innovative radio services to the American public. Towards this end, we applaud the Commission's initiative in creating a spectrum reserve for new emerging telecommunications services and technologies. In these Comments, the IEEE-USA has made a number of suggestions and recommendations which, in our opinion, will help the Commission focus its efforts in this very important proceeding. By focusing its efforts, we believe the Commission will be able to reach its very laudable goal of ensuring the availability of spectrum for the continued growth and development of new and innovative services made possible by emerging and anticipated future technologies.

Respectfully submitted,



Arvid G. Larson, P.E.

Vice President

Professional Activities

Institute of Electrical and Electronics Engineers, Inc. - USA

June 5, 1992